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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,715	06/22/2006	Tsuyoshi Hasegawa	60303.58/ho	9865

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EXAMINER

GAMINO, CARLOS J

ART UNIT	PAPER NUMBER
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1735

NOTIFICATION DATE	DELIVERY MODE
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05/04/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/596,715	Applicant(s) HASEGAWA ET AL.	
	Examiner CARLOS GAMINO	Art Unit 1735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-17 and 24-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-17 and 24-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. **Claims 12-17 and 24-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Radzievskii et al. (Vacuum brazing of plate-rib heat exchangers) in view of Hasegawa et al. (EP 1 068 924).

Regarding claim 12, Radzievskii teaches:

Assembling stainless steel plate rib heat exchangers [first and second members] with a Cu-Ni foil (Cu = 79-82wt%, Ni = 18-20wt%, Fe = 0-1wt%, Mg = 0-0.3wt%, Si = 0-0.2wt%) in between them and brazing at 1200°C.

Radzievskii does not teach:

the first member including a base plate made of a ferrous material and a diffusion suppressing layer laminated on the base plate for suppressing diffusion of Fe atoms into the braze joint from the base plate during the brazing,

the diffusion suppressing layer being made of a Ni-Cr alloy consisting essentially of not less than about 15 mass% and not greater than about 40 mass% of Cr,

assembling the first and second members into a temporary assembly with the brazing material foil disposed between the diffusion suppressing layer of the first member and the second member;

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fusing the brazing material foil and diffuse Ni atoms and Cr atoms into the fused brazing material foil from the diffusion suppressing layer to form the braze joint, causing the resulting brazing material of the braze joint to have a higher melting point than the brazing temperature to self-solidify all of the brazing material of the braze joint wherein the braze joint is free from segregated solidification and is made of a Cu-Ni-Cr alloy containing not less than about 34 mass% of Ni and not less than about 10 mass% of Cr;

and cooling the resulting assembly [*However, the examiner notes that the assembly is intrinsically cooled in order for other manufacturing steps to happen such as: assembly, inspection, packing, and shipping.*].

Hasegawa teaches brazing stainless steel heat exchangers with a Cu-Ni foil and laminating a Ni-30wt%Cr diffusion barrier layer onto the stainless steel in order to prevent deterioration in the brazed joint; paragraphs 0019-0023.

It would have been obvious to one of ordinary skill in the art at the time of the invention to place the laminated Ni-30wt%Cr diffusion barrier layer of Hasegawa between the stainless steel and braze foil of Radzievskii in order to prevent deterioration in the braze joint. Furthermore, since the prior art method is identical to that claimed it is the examiner's position that the claimed result is accomplished.

Regarding claim 24, the rejection used in claim 1 also applies here with the following additions. The examiner notes that a foil is a layer and that the foil is intrinsically placed on the second member in order to be able to form the brazed joint.

Regarding claims 13 and 25, Radzievskii teaches:

wherein the second member includes a base plate made of a ferrous material
[the components are stainless steel; see abstract],

Radzievskii does not teach:

a diffusion suppressing layer laminated on the base plate for suppressing diffusion of Fe atoms into the braze joint from the base plate during the brazing, the diffusion suppressing layer of the second member being composed of a Ni-Cr alloy essentially comprising not less than about 15 mass% and not greater than about 40 mass% of Cr

Hasegawa teaches that when forming a brazed structure of multiple members each member has a laminated Cr diffusion barrier layer; paragraph 0054 and figure 13.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to place the laminated Ni-30wt%Cr diffusion barrier layer onto each side of the members to be brazed in order to prevent the brazed joint from deteriorating.

Regarding claims 14 and 26, Radzievskii teaches:

wherein the base plates of the first member and the second member are each made of a stainless steel *[as noted above the members are stainless steel]*.

Regarding claims 15 and 27,

wherein the Ni-Cr alloy of the diffusion suppressing layer has a Cr content of not less than about 30 mass% *[as noted above the Cr content is 30%; paragraph 0023]*.

Regarding claims 16 and 28, Radzievskii teaches:

wherein the brazing foil or layer has a thickness of not less than about 20 μm and not greater than about 60 μm *[the foil has a thickness of 20-30 μm]*.

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Regarding claims 17 and 29, Radzievskii does not teach:

wherein the brazing temperature is not less than about 1,200°C and not higher than about 1,250°C [*brazing is done at 1200 °C; abstract*].

Radzievskii does not teach:

a duration for which the temporary assembly is maintained at the brazing temperature is not shorter than about 30 min and not longer than about 60 min.

Hasegawa teaches that the time spent at the brazing temperature can be varied in order to increase the corrosion resistance of the brazed joint; paragraph 0056.

It would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the brazing time to about 30 to about 60 min in order to achieve the desired corrosion resistance and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Response to Arguments

3. Applicant's arguments filed 4/20/11 have been fully considered but they are not persuasive.

4. The applicant's arguments are based on Hasegawa teaching away from the claimed invention because Hasegawa teaches that when a diffusion barrier layer of 100wt% Ni is used with a Cu-20wt%Ni brazing alloy the resulting joint will not have the final joint composition of between 15-25wt% Ni which gives enhanced or improved corrosion resistance. This argument is not persuasive for a couple of reasons.

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Hasegawa does not provide any example of using a Ni-30wt%Cr diffusion barrier layer, therefore there is no evidence that this layer would act in the same manner as the pure nickel layer. Second, a brazed joint with a range of 15-25wt% Ni is the **optimal** corrosion resistance range, which means that outside this range one still gets corrosion resistance. Therefore, even if the Ni-30wt% Cr layer behaved as applicant's claim one more concerned with the diffusion of Fe atoms into the braze material may consider this a fair trade off.

5. In response to the applicants statement that the examiner's statement of "Furthermore, since the prior art method is identical to that claimed it is the examiner's position that the claimed result is accomplished."... "is incorrect and unsupported by any evidence of record, because the Examiner has failed to refer to any method step other than the brazing temperature at 1200 °C in Radzievskii et al., and because the Examiner has failed to consider that in Hasegawa et al.'s invention, the brazing conditions, which includes not only the brazing temperature and its holding time but also each of the nickel content of the brazing filler metal and the Fe atom diffusion suppression layer, excludes the cases in which the nickel content of the brazing filler metal section (i.e., braze joint as recited in Applicant's claims) is greater than 25 wt% in view of enhancing or improving corrosion resistance for the reasons described above." This statement is not persuasive since examiner has addressed the other claimed method steps and has considered what Hasegawa teaches. The examiner notes that if claimed method is capable of achieving a self solidified braze joint then the applicant

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needs to explain how the prior art method does not achieve the claimed result when all of the required steps to do so are met.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARLOS GAMINO whose telephone number is (571) 270-5826. The examiner can normally be reached on Monday-Thursday, 9:30am-7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica L. Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carlos Gamino/
Examiner, Art Unit 1735

/Kiley Stoner/
Primary Examiner, Art Unit 1735